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Claims:

1. A method for producing hyperpolarized ^{129}Xe comprising
 - 5 a) preparing a mixture of xenon, ~~an additive~~ and a free radical
 - b) hyperpolarizing said mixture according to the DNP method to obtain hyperpolarized ^{129}Xe and
 - c) optionally separating said xenon from the other components of the mixture.
- 10 2. A method according to claim 1 wherein the additive is ~~at least one solvent or a mixture of solvents which has good glass-forming properties and/or lipophilic properties.~~
- 15 3. A method according to claim 1 and ~~2~~, wherein the ~~additive is a~~ solvent or a mixture of solvents ~~selected from the group consisting of straight chain or branched C₆-C₁₂-alkanes, C₅-C₁₂-cycloalkanes, fatty alcohols, fatty esters, substituted benzene derivatives, mono- or polyfluorinated solvents, single chained alcohols and glycols.~~
- 20 4. A method according to claims 1 to ~~3~~ ² wherein the mixture in step a) is prepared from liquid xenon.
- 25 5. A method according to claims 1 to ~~4~~ ³ wherein the mixture in step a) is prepared by condensing xenon gas on the top of ~~the additive~~ and the free radical, warming the components until xenon and the additive are in a liquid state and mixing the components until a homogeneous mixture is obtained.
- 30 6. A method according to claims 1 to ~~5~~ ⁴ wherein in step b) ^{129}Xe is directly hyperpolarized.
7. A method according to claims 1 to ~~6~~ ⁵ wherein in step b) the NMR active nuclei of ~~at least one solvent or mixture of solvents~~ the additive are hyperpolarized and this polarization is subsequently transferred to ^{129}Xe by a cross-polarization sequence.

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8. A method according to claims 1 to 7 wherein xenon enriched with ^{129}Xe is used.

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9. A method according to claims 1 to 8 wherein in step c) xenon is separated from the other components of the mixture by warming the mixture until xenon is in the gas state and collecting said xenon in a suitable container.

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10. A method for the production of a contrast agent comprising
a) preparing a mixture of xenon, ^⑥an additive and a free radical
b) hyperpolarizing said mixture according to the DNP method to obtain
10 hyperpolarized ^{129}Xe
c) separating said xenon from the other components of the mixture, and
d) optionally condensing the separated xenon again.

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12. Use of DNP - hyperpolarized ^{129}Xe ^{produced according to the method of} ^{claims 1 to 8} for the manufacture of a contrast agent for
15 the use in magnetic resonance imaging of the human or non-human animal body, preferably of the lungs of the human or non-human animal body.